

### REMARKS

Claims 1-19 are pending in this application. All of the pending claims are rejected. Claims 1, 16 and 17 are currently amended. Reconsideration is respectfully requested.

The Specification was subject to objection based on use of the terms “long,” “short,” “near,” “nearby,” “close,” and “close by” to describe spacing. In particular, the Office asserts that those terms are indefinite. Applicants respectfully traverse. Long spacing detectors and short spacing detectors are terms of art that are well understood by those of ordinary skill in the art. The newly cited *Odom* reference, for example, illustrates a “long spaced gamma ray detector 16” and “near gamma ray detector 14” in Figure 1 (see also column 8, lines 14-17). Further, the Specification describes specific ranges of spacing of some long and short spacing detectors at paragraph [0007] in the Background, at paragraph [0030] in the Detailed Description, and in claims 2-5. It should be understood from those ranges that the long spaced detector is disposed at a greater distance from the source than the short spaced detector. Because the terms which are the basis of the objection are both (1) terms of art, and (2) described in greater detail in the Specification, Applicants submit that the objection is not well founded and must therefore be withdrawn.

Claims 1-19 are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter. The Office suggests at pages 4, 5 and 7 that outputting the results to a computer-readable medium would overcome the rejection. Independent claims 1, 16 and 17 have been amended accordingly, support for which is in the Specification at paragraph [0032]. The rejections of the dependent claims is based on the rejections of the independent claims. Withdrawal of the 101 rejections of claims 1-19 is therefore requested.

Claims 1-19 are rejected under 35 U.S.C. 102 based on *Odom* (U.S. 6,936,812). *Odom* describes determining density, porosity and fluid saturation of formations penetrated by a borehole. While the possibility of operation in a cased borehole is mentioned at column 4, lines 16-17, *Odom* is not specifically directed to the problem of obtaining accurate measurements from behind a casing. Note, for example, that *Odom* fails to describe the effects of particular casing and cement thicknesses, whereas the present application describes such effects at paragraph [0019]. Similarly, *Odom* fails to describe techniques that help compensate, such as adjusting count rate selection, as described in paragraph [0017], and reducing logging speed, as described in paragraph [0031]. Further, *Odom* describes (at column 8, lines 7-13) use of a neutron generator as the radiation source, which is non-ideal for use in the presence of a casing.

In view of the above, claim 1 distinguishes *Odom* by reciting “a method of determining formation density in a cased hole environment using **a logging tool having a gamma ray**

**source**, a long spacing detector, and a short spacing detector.” (emphasis added) Withdrawal of the rejections of claim 1, and associated dependent claims 2-15 is therefore requested.

Claims 16 and 17 further distinguish Odom by reciting a backscatter detector disposed between the gamma ray source and the short spacing detector. A similar limitation is recited in claim 6, which the Office rejected based on Figure 1 and column 6 of *Odom*. In particular, the Office equates “short detector 10” with the recited backscatter detector because of the adjustable spacing feature. That reasoning is erroneous because element “10” of *Odom* is the logging tool itself, rather than the short detector. See “Fig. 1 illustrates a logging tool 10 comprising ...” at column 8, line 7. The Office might argue that *Odom*’s neutron detector (15) is equivalent to a backscatter detector. However, that is factually incorrect, and as a practical matter the neutron detector (15) cannot be used to help estimate casing thickness in the manner described in paragraphs [0020] through [0022] of the present application. Still further, Figure 1 of *Odom* illustrates the neutron detector (15) as being located between “near gamma detector” (14) and “long gamma detector” (16), whereas Figure 1 and paragraph [0008] of the present application illustrate and describe the backscatter detector (BS) as being between short spacing detector (SS) and the gamma ray source. In other words, even assuming the elements were equivalent, the positions of the elements is distinctly different. The Office asserts that *Odom* teaches adjustable spacing at column 6, line 15, but Applicants are unable to find any such teaching. Further, even if *Odom*’s detectors have adjustable spacing, there is certainly no basis for asserting that the adjustability would be to such an extent as to permit re-ordering the detectors, i.e., moving the neutron detector (15) to the other side of near gamma detector (14) so that neutron detector (15) becomes closer to source (12) than the near gamma detector (14). Claims 16 and 17 therefore distinguish Odom both by reciting a gamma ray source and by reciting “where the backscatter detector is disposed between the gamma ray source and the short spacing detector, “ and “the backscatter detector disposed between the gamma ray source and the short spacing detector,” respectively. Claims 18 and 19 are dependent claims which further distinguish the invention, and which are allowable for the same reasons as their respective base claims. Withdrawal of the rejections of claims 16-19 is therefore requested.

In light of the above amendments and remarks, Applicants believe that the present application and the claims as amended are in proper condition for allowance. Such allowance is earnestly requested. If the Examiner is contemplating any action other than allowance of all pending claims, the Examiner is urged to contact Applicants’ representative, Jody Lynn DeStefanis, at (617) 768-2269.

Other than the fee associated with the petition for a one-month extension of time, which is separately authorized, Applicants do not believe that any fees are required in connection with this response. However, in the event that it is determined that a fee is required, the Commissioner is hereby authorized to charge **Deposit Account No. 19-0615** for any deficiency.

Respectfully submitted,



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